

the dovetail root section having flank surfaces with at least one aperture extending from each flank surface through a portion of the dovetail root section; a high strength metal member disposed through each dovetail root section aperture; and a metal sheath attached to the leading edge.

2. The laminated airfoil of claim 1 wherein the metallic foil is selected from the group consisting of titanium alloys, nickel base superalloys and stainless steels.

3. The laminated airfoil of claim 2 wherein the metallic foil is a titanium alloy foil produced by superplastic forming.

4. The laminated airfoil of claim 1 wherein the elastomeric layer is selected from the group consisting of an adhesive film having a thermoplastic carrier, a modified adhesive film and a polyurethane film coated with an adhesive layer.

5. The laminated airfoil of claim 4 wherein the film of the adhesive film having a thermoplastic carrier is selected from the group consisting of HXT-440, or HXT-441.

6. The laminated airfoil of claim 4 wherein the film of the modified adhesive film is FM-300I.

7. The laminated airfoil of claim 4 wherein the adhesive layer of the polyurethane film coated with an adhesive layer is AF163-2.

8. The laminated airfoil of claim 1 wherein the high strength metal members are titanium-alloy pins.

9. The laminated airfoil of claim 1 wherein the airfoil is a wide chord fan blade for a turbine engine.

10. The laminated airfoil of claim 1 wherein the airfoil is a vane for a turbine engine.

11. An energy absorbing, laminated airfoil having a tip portion, a dovetail root section, a leading edge extending from the tip portion to the root section, and a trailing edge oppositely disposed to the leading edge and extending from the tip portion to the root section, comprising:

alternating layers of a metallic foil and a polymeric composite layer forming a laminated composite airfoil, the metallic foil forming the first and last layers;

the dovetail root section having flank surfaces with at least one aperture extending from each flank surface through a portion of the dovetail root section; a high strength metal member disposed through each dovetail root section aperture; and a metal sheath attached to the leading edge.

12. The airfoil of claim 11 wherein the polymeric composite layer is a fiber embedded in a flowable resin-based matrix.

13. The laminated airfoil of claim 12 wherein the fiber of the polymeric composite layer is a carbon fiber and the matrix is selected from the group consisting of epoxy resin, Bis-maleimide resin and polycyanate resin.

14. The laminated airfoil of claim 13 wherein the polymeric composite layer is selected from the group consisting of F3900/IM-7 and 8551-7/IM-7.

15. The laminated airfoil of claim 11 wherein the metallic foil is selected from the group consisting of

titanium alloy, nickel base superalloys and stainless steels.

16. The laminated airfoil of claim 11 wherein the metallic foil is a titanium alloy foil produced by superplastic forming.

17. The laminated airfoil of claim 11 wherein the high strength metal members are titanium alloy pins.

18. The laminated airfoil of claim 11 wherein the airfoil is a fan blade for a turbine engine.

19. The laminated airfoil of claim 11 wherein the airfoil is a vane for a turbine engine.

20. An energy absorbing, damped, laminated airfoil having a tip portion, a dovetail root section, a leading edge extending from the tip portion to the root section, and a trailing edge oppositely disposed to the leading edge and extending from the tip portion to the root section, comprising:

alternating layers of a metallic foil, a polymeric composite layer, and an elastomeric layer, forming a laminated composite airfoil, the metallic foil forming the first and last layers, and the elastomeric layer interposed between each piece of metallic foil and polymeric composite layer;

the dovetail root section having flank surfaces with at least one aperture extending from each flank surface through a portion of the dovetail root section; a high strength metal member disposed through each dovetail root section aperture; and a metal sheath attached to the leading edge.

21. The airfoil of claim 20 wherein the polymeric composite layer is a fiber embedded in a resin-based matrix.

22. The laminated airfoil of claim 21 wherein the fiber of the polymeric composite layer is a carbon fiber and the matrix is selected from the group consisting of epoxy resin, Bis-maleimide resin and polycyanate resin.

23. The laminated airfoil of claim 20 wherein the metallic foil is selected from the group consisting of titanium alloy metals, nickel base superalloys and stainless steels.

24. The laminated airfoil of claim 20 wherein the metallic foil is a titanium alloy foil produced by superplastic forming.

25. The laminated airfoil of claim 20 wherein the high strength metal members are titanium alloy pins.

26. The laminated airfoil of claim 20 wherein the elastomeric layer is a modified adhesive film.

27. The laminated airfoil of claim 26 wherein the modified adhesive film is FM-300I.

28. The laminated airfoil of claim 20 wherein the elastomeric layer is an adhesive film having a thermoplastic carrier.

29. The laminated airfoil of claim 28 wherein the adhesive film having a thermoplastic carrier is selected from the group consisting of HXT-440 and HXT-441.

30. The laminated airfoil of claim 20 wherein the airfoil is a fan blade for a turbine engine.

31. The laminated airfoil of claim 20 wherein the airfoil is a vane for a turbine engine.

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